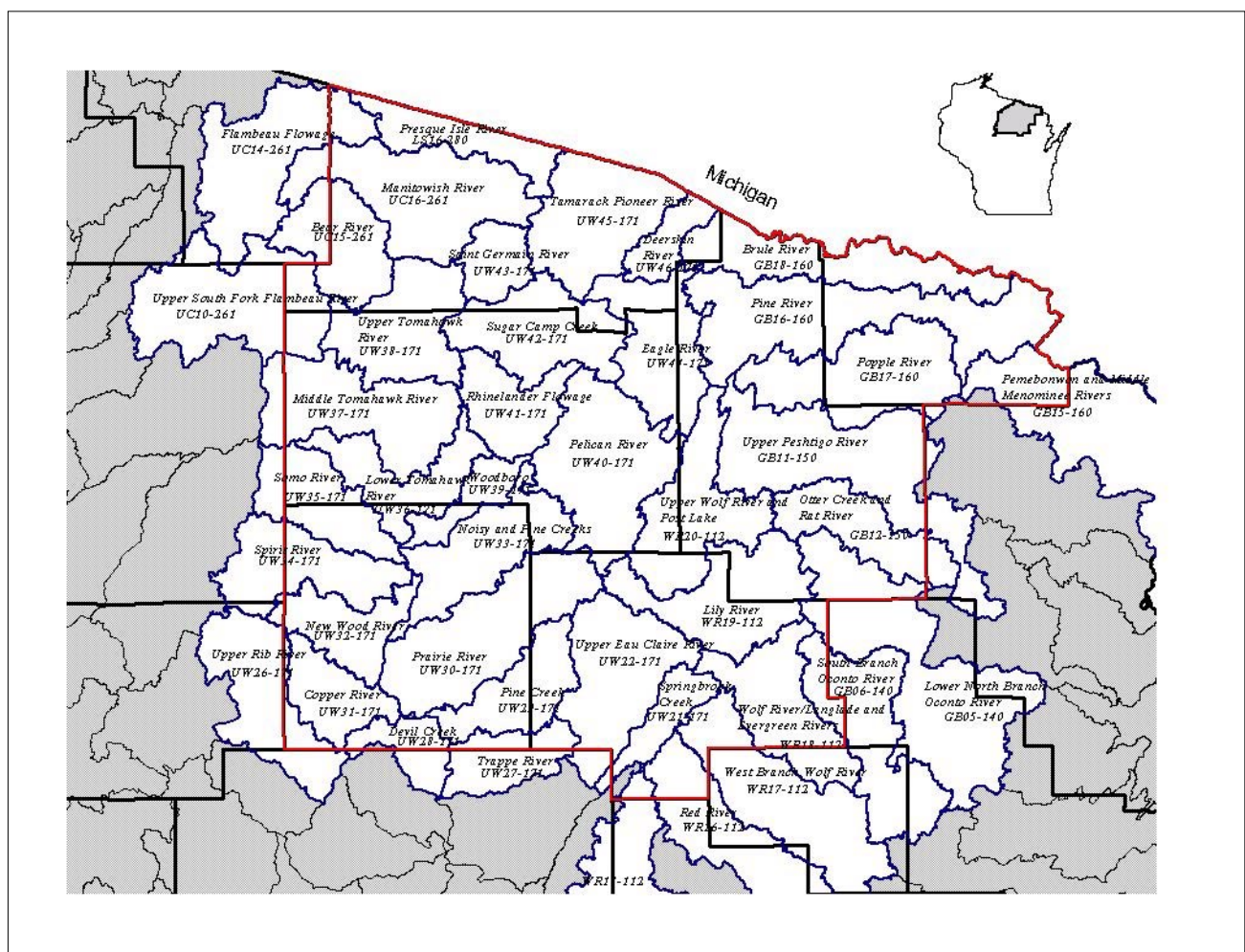


CHAPTER 1 BASIN OVERVIEW

HEADWATERS BASIN LOCATION:

The Headwaters Basin (Figure 1) is comprised of a six county area in the Northern part of the state. It includes the counties of Forest, Florence, Lincoln, Langlade, Oneida and Vilas. Total surface area (land & water) for the basin is 5,438 square miles with Florence County having the smallest area of 499 square miles and Oneida having the largest area of 1,217 square miles. A total of five basins and 42 watersheds lie partly or entirely in the Headwaters Basin. Those basins include Green Bay, Lake Superior, Upper Chippewa, Wolf River and the Upper Wisconsin. The Headwaters Basin contains villages, towns, and cities that range in size from small unincorporated towns like Harshaw and Sugar Camp, to larger cities like Rhinelander and Merrill that have populations of 7,427 and 9,860 respectively.

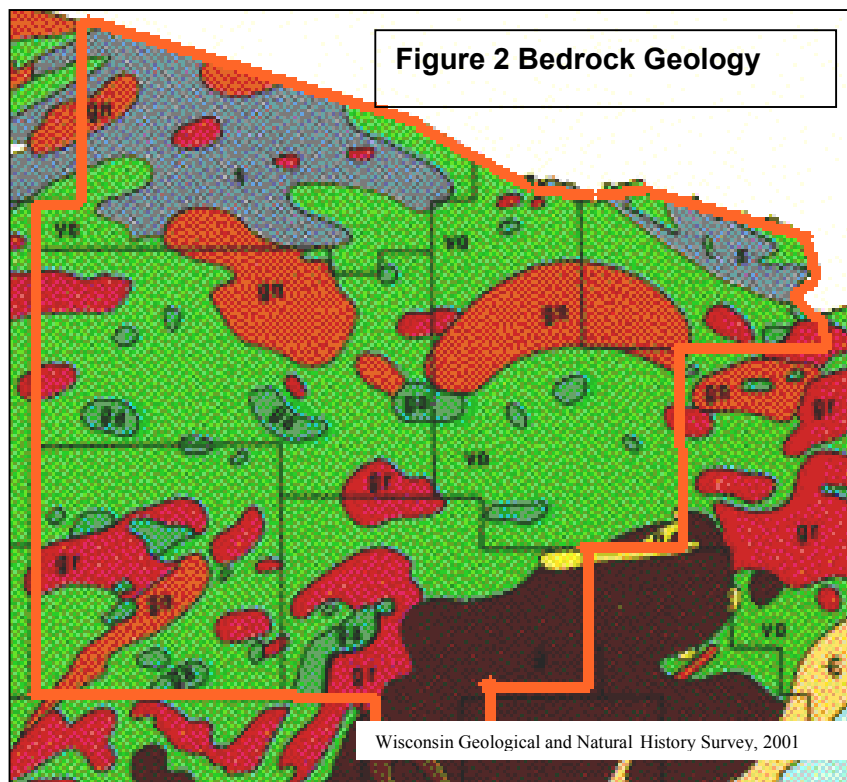
Figure 1: Headwaters Basin



GLACIAL GEOLOGY

Wisconsin's northern forest landscape was formed 10,000-12,000 years ago when glaciers melted and left an array of geological features that made the north the way it is today. In some areas the glaciers swept the surface clean, down to the bedrock (Figure 2). Other places, the ice and meltwater left behind diverse soil types, gravel, and boulders. Glaciers created many depressions, which filled with water to form the many wetlands and lakes that we have today. The unique geological features of the Headwaters Basin were created as water from a melting glacier flowed into the area, carrying huge deposits of sand and gravel. This area is now dotted with numerous lakes, wetlands, headwater streams, and tiny bogs, creating diverse habitat which is home to a wide variety of plants and animals.

- gr= granite, diorite and gneiss
- gn= granite, gneiss and amphibolite
- g= Wolf River rocks/ rapakivi granite, syenite
- s= argillite, siltstone, quartzite, graywacke and iron formation
- vo= basaltic to rhyolitic metavolcanic rocks with some metasedimentary rocks
- ga= meta-gabbro and hornblende diorite



GROUNDWATER

Groundwater is the only source of drinking water in the basin and provides baseflow to lakes, rivers, streams and wetlands. Groundwater is present in both the crystalline bedrock and overlying glacially deposited sediments. The Precambrian rocks are dense and impermeable and yield water only where fractures and weathering has occurred. These rocks generally are used for water supplies only where adequate quantities of water cannot be obtained from overlying glacial deposits.

The overlying glacial sediments range in thickness between 50 and 200 feet. All drinking water is obtained from this relatively thin layer of sediments. Glacial deposits generally are thinnest in the southern part of the basin. Permeable glacial sediments deposited in valleys cut into the bedrock are important sources of water in the basin. A large glacially deposited sand and gravel plain north and east of Antigo provides large quantities of water to irrigation wells.

Natural groundwater quality is good but can be high in iron and tannins. Very few groundwater sample analytical results are available for private wells located in the basin. Available sample analytical results for nitrate and pesticides, two of the most common groundwater contaminants, are summarized below.

Groundwater Contamination Potential Ranking by Watershed

Each watershed within the Headwaters Basin was ranked based on land coverage and groundwater sample analytical results in the DNR's GRN database. The table below lists each watershed score and gives a short description of the land cover and groundwater sample analytical data that determined the score.

Groundwater contaminants used for the ranking include nitrate and pesticides, as these are common nonpoint source contaminants. A score of 20 or more is considered medium. At 30 or greater, the score is considered high for groundwater contamination potential. Because land cover in the Headwaters Basin

consists mostly of forest and wetland all watershed scores except two are ranked low for potential groundwater contamination due to nonpoint sources of pollution. There is 1 permitted Confined Animal Feeding Operations in the basin. Very few private well samples have been collected and analyzed for nitrates or pesticides in most watersheds. Where samples were available for analyses, the scores were medium or high.

Abbreviations include:

ES: Groundwater enforcement standard as per NR 140 Wis. Adm. Code. For nitrate the groundwater ES is 10 ppm.

PAL: Groundwater Preventive Action Limit as per NR 140 Wis. Adm. Code. For nitrate the groundwater PAL is 2 ppm.

CAFO: Confined Animal Feeding Operation that consists of the equivalent of 1000 animal units.

Watershed	Score	Comments
Lower North Branch Oconto River	6.24	Land cover is 65% forest, 20% wetland and 6% agriculture.
South Branch Oconto River	8.73	The watershed consists of 70% forest, 14% wetland and 8% agriculture.
Upper Peshtigo River	2.83	The watershed is 67% forest and 22% wetland.
Otter Creek and Rat River	1.61	Land cover is 76% forest, 16% wetland and 1% agriculture.
Pemebonwon and Middle Menominee Rivers	3.80	Land cover in the watershed is 65% forest, 20% wetlands and 3% agriculture.
Pine River	1.43	The watershed consists of 76% forest, 16% wetland and 1% agriculture.
Popple River	1.08	The watershed is 71% forest and 24% wetland.
Brule River	1.95	The watershed is 80% forest, 10% wetland and 1% agriculture.
Presque Isle River	0.17	The watershed consists of 62% forest, 17% wetland and 17% open water.
Upper South Fork Flambeau River	1.03	Land cover in the watershed is 51% forest, 35% wetland and 1% agriculture
Flambeau Flowage	0.42	Land cover consists of 52% forest, 28% wetland and 14% open water.
Bear River	0.64	The watershed consists of 43% forest, 33% wetland and 18% open water.
Manitowish River	0.38	The watershed is 61% forest, 19% wetland and 13% open water.
Springbrook Creek	75.72	There is one CAFO in the watershed. Pesticides were detected in 10 private wells. Of 92 wells tested for nitrate, 17% exceeded the ES and 77% exceeded the PAL. Land cover in the watershed is 56% agriculture, 23% forest and 4% urban.
Upper Eau Claire River	30.56	Of 47 wells tested for nitrate, 32% exceeded the ES and 60% exceeded the PAL. The watershed consists of 42% forest, 28% wetland and 15% agriculture.
Pine Creek	15.97	The watershed is 51% forest, 18% wetland, 15% agriculture and 13% grassland.
Prairie River	6.23	Land cover in the watershed consists of 60% forest, 20% wetland, 10% grassland and 5% agriculture.
Copper River	9.15	The watershed is 61% forest, 23% wetland and 8% agriculture.
New Wood River	0.50	Land cover in the watershed consists of 72% forest and 23% wetland.
Noisy and Pine Creeks	1.55	The watershed is 60% forest, 22% wetland and 1% agriculture.
Spirit River	1.12	Land cover consists of 63% forest, 25% wetland and 1% agriculture.
Somo River	0.46	The watershed is 52% forest and 35% wetland.
Lower Tomahawk River	0.65	The watershed consists of 53% forest and 26% wetland.
Middle Tomahawk River	0.19	Land cover in the watershed consists of 56% forest and 28% wetland.

Upper Tomahawk River	11.65	Of 41 wells tested for nitrate, 5% exceeded the ES and 24% exceeded the PAL. Land cover in the watershed is 59% forest, 17% wetland, 14% open water and 1% urban.
Woodboro	4.20	The watershed consists of 55% forest, 13% wetland, and 8% open water, 2% urban and 2% agriculture.
Pelican River	4.16	The watershed is 43% forest, 35% wetland and 5% open water.
Rhineland Flowage	14.84	Of 16 wells tested for nitrate, 43% exceeded the PAL. Land cover in the watershed consists of 53% forest, 27% wetland, 8% open water and 1% urban.
Sugar Camp Creek	13.02	Of 22 wells tested for nitrate, 13% of sample analytical results exceeded the ES and 50% exceeded the PAL. Land cover is 53% forest, 25% wetland and 13% open water.
Saint Germain River	10.75	Of 8 wells tested for nitrate, 12.5% of sample analytical results exceeded the ES and 25% exceeded the PAL. The watershed consists of 68% forest, 14% open water and 12% wetland.
Eagle River	2.15	The watershed consists of 52% forest, 27% wetland, 13% open water and 1% urban.
Tamarack Pioneer River	1.11	The watershed is 63% forest, 17% wetland and 10% open water.
Deerskin River	1.19	The watershed is 71% forest, 13% wetland and 8% open water.
Middle & South Branches Embarrass River	25.61	The watershed consists of 31% forest, 25% agriculture, 24% wetland and 18% grassland.
Red River	22.22	Land cover in the watershed is 48% forest, 22% agriculture, 18% wetland, and 9% grassland.
West Branch Wolf River	7.72	Land cover consists of 74% forest, 11% wetland, and 7% agriculture.
Wolf River/Langlade and Evergreen Rivers	6.51	The watershed is 78% forest, 8% wetland and 6% agriculture.
Lily River	3.15	The watershed consists of 72% forest, 13.5% wetland and 3% agriculture.
Upper Wolf River and Post Lake	2.92	The watershed is 60% forest, 24% wetland and 6% open water.

POPULATION TRENDS/DEMOGRAPHICS

Below are forecasted population trends for the six county region of the Headwaters Basin.

Table 1. Population Trends by County for the Headwaters Basin.

	Census		Projections				
COUNTY NAME	1990	1995	2000	2005	2010	2015	2020
Oneida	31,679	33,563	34,067	33,953	33,601	32,992	31,954
Lincoln	26,993	28,243	28,770	28,983	29,084	29,024	28,748
Langlade	19,505	20,300	20,572	20,650	20,658	20,548	20,255
Vilas	17,707	18,987	19,334	19,223	18,905	18,388	17,607
Forest	8,776	8,980	9,119	9,257	9,344	9,399	9,458
Florence	4,590	5,211	5,552	5,741	5,859	5,920	5,919

State of Wisconsin Department of Administration- 2000 Madison, WI

FUTURE HOUSING DENSITIES

The following figures show the projected housing density increase in Northern Region. The years 1940, 1990 and 2010 are compared. Assuring environmentally sound development will be an issue.

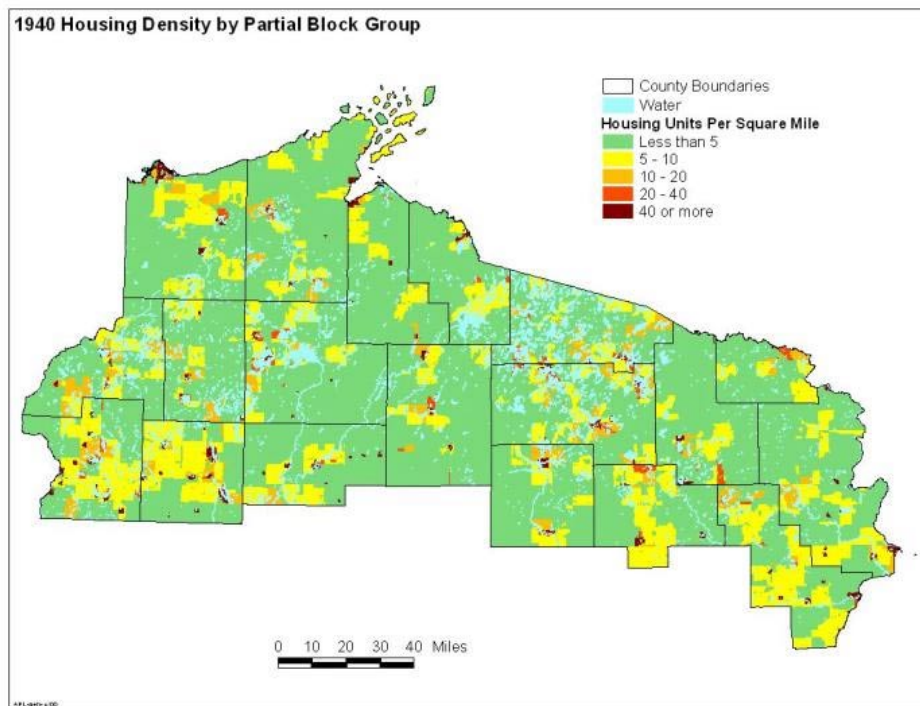
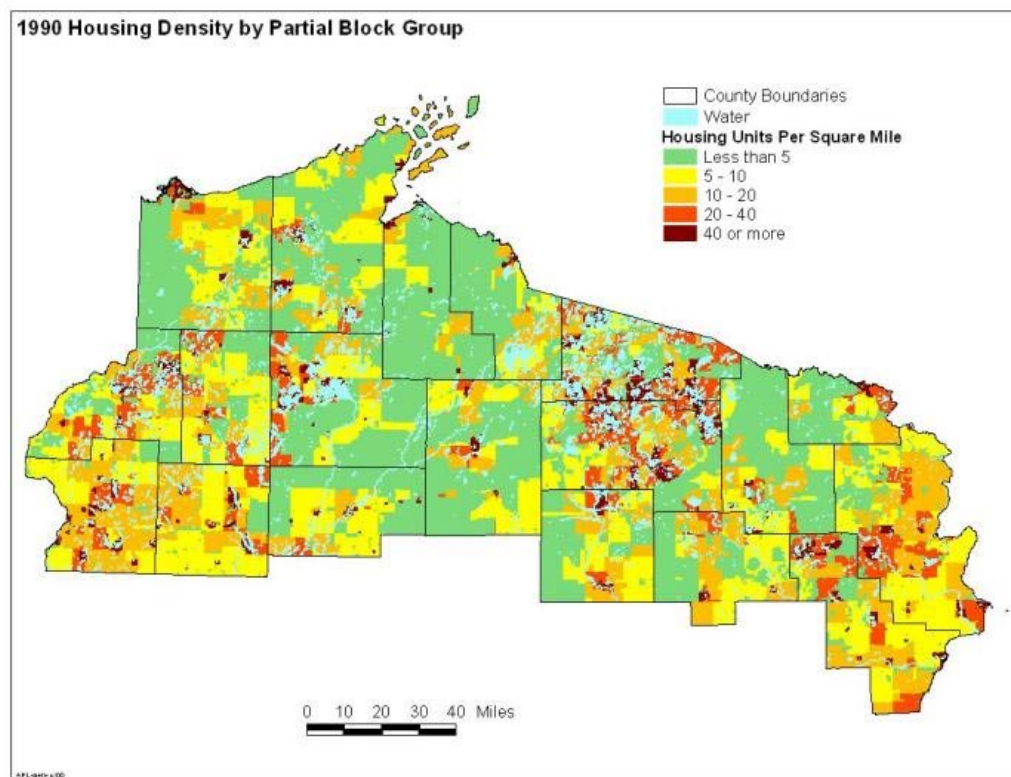
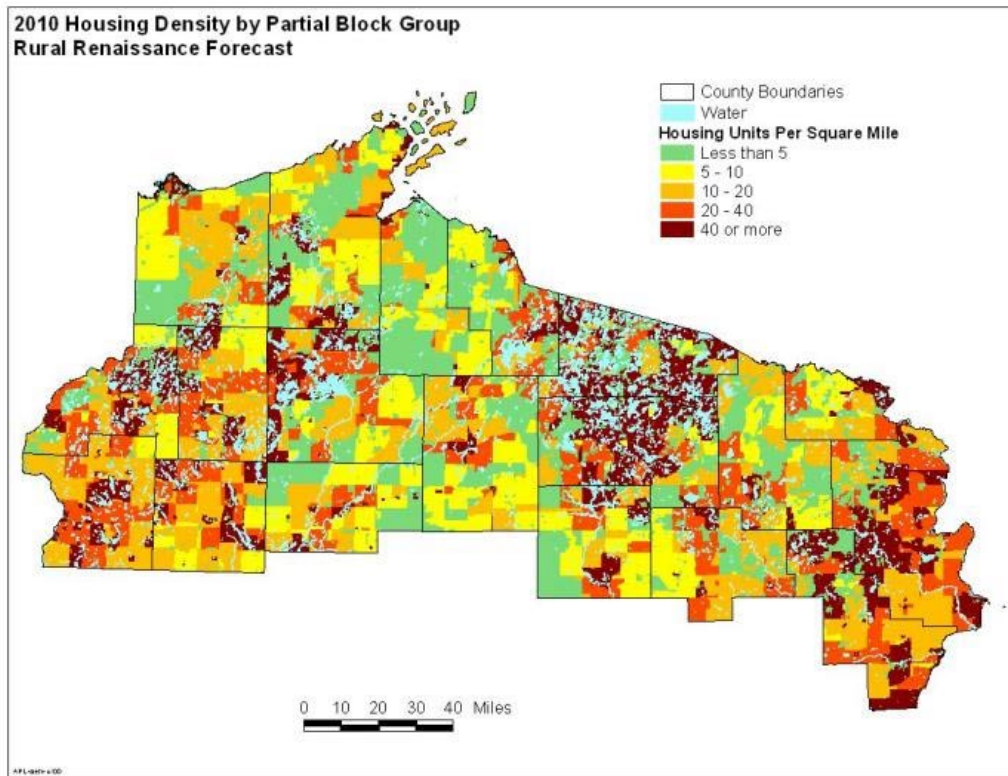
Figure 3. Housing Density (1940).**Figure 4. Housing Density (1990).**

Figure 5. Housing Density (2010).

ECOLOGICAL LANDSCAPES

An ecological landscape is a *geographic area* that has similar land uses and ecological themes throughout. Ecological landscapes provide a framework for organizing and presenting information that is useful in making ecologically sound management decisions. Management that is compatible with the ecological capability of the land contributes to the larger efforts of sustaining ecosystems and natural communities statewide.

There are fifteen Ecological Landscape (EL) areas within Wisconsin, and five of these are found in the Headwaters Basin: North Central Forest, Farm and Forest Transition, Northern Highland, Northeast Hills and Northeast Sands (Figure 3).

North Central Forest

The North Central Forest EL is characterized by end and ground moraine with extensive northern hardwoods and small creeks, kettle lakes and associated large wetlands. There are almost no large lakes. The moraines are also the headwaters of many major streams. Soils are rocky and often poorly drained acid silt loam's, over underlying acidic, reddish, sandy loam till. Some areas are loam and loamy sand. Vegetation is primarily hardwood forest, made up of a mix sugar maple, basswood and red maple, and some hemlock, white pine and red pine. Tamarack, white cedar, black ash and black spruce are present in the conifer swamps. The major land use is growing timber for pulp production. Because this is an area with large public lands, recreation activities are important. There is marginal agriculture with some dairy farms using pastures.

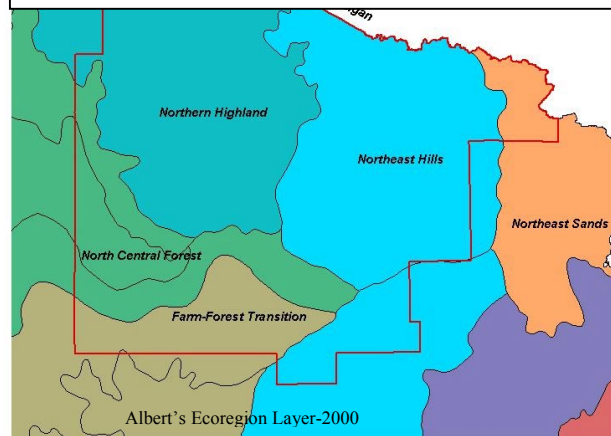
Farm and Forest Transition

This EL is found along the southern edge of the Headwaters Basin in Lincoln and Langlade Counties. It is characterized by a mix of forest, agriculture and swamp in the transition zone between northern forests and central hardwoods. Soils are diverse and range from sandy loam to loam and shallow silt loam (both poorly drained and well drained). Vegetation is mainly northern hardwood forest dominated by sugar maple and hemlock, with some yellow birch, red pine, and white pine. There are small areas of conifer swamps near the headwaters of streams. Major land uses are agriculture and forestry. Agriculture is focused on dairy farming, row crops, vegetables and pasture. Forestry is the dominant land use on the eastern portion of the EL.

Northern Highland

This EL is found almost entirely within Oneida and Vilas counties, within the Headwaters Basin. Pitted outwash plains that form many kettle lakes and an extensive mix of forest, barren and wetland characterize this former pinery. The Wisconsin River and many streams originate in the outwash plain and the extensive wetlands (peatlands and bogs) occur near these headwaters. Soils are acidic and unproductive due to low moisture retention capacity and humus loss. Paper birch and aspen are common in areas where white pine and red pine were once dominant. Land use is primarily forestry with recreation also being important. The high density of lakes is globally significant. Some of the wetlands in this EL are used for cranberry production.

Figure 6. Ecoregions in the Headwaters Basin



Northeast Hills

This EL is found in the eastern portion of the Headwaters Basin. Silt-loam capped ground moraine and outwash with linear lakes and a narrow band of stagnation moraines and outwash with inclusions of ground moraines are characteristic. The silt cap in the northern part of the EL results in a diverse and rich ground cover flora as well as tree species not occurring commonly on the more prevalent sandy loam soils in this part of the state. Soils are generally well drained, derived from rocky, red, sandy loam till or gravelly, loamy sand outwash and are typically underlain with outwash deposits of sand and gravel. Most large lakes are linear and small kettle lakes are common on the moraines. Many small creeks and rivers drain numerous linear wetlands between drumlins. Northern hardwoods dominated by a mix of sugar maple, hemlock, basswood, and white pine were originally found on the uplands and tamarack and black spruce dominated most of the forested wetlands. Extensive northern hardwood forests are now dominant on the landscape and the major land uses are forestry and recreation.

Northeast Sands

Northeast Sands are found in the extreme northeast corner of the Headwaters Basin in Florence County. This EL is characterized by glaciated topography with sandy soils and extensive oak and Pine Barrens and forest. There are many kettle lakes within the pitted outwash plains. The largest river is the Menominee, bordering Wisconsin and Michigan. Vegetation consists of predominantly aspen and paper birch on sites that were dominant red and white pine historically. Jack pine remains dominant on the outwash plains with the presence of northern pin oak as well. In these outwash plains, there is a presence of pitted depressions, frequently containing wetlands. The major land use is forestry.

LAND USE PATTERNS AND PUBLIC LAND

The southern part of the Headwaters Basin is a concentrated area of agricultural land use. 57% of the land use in the Springbrook watershed is used for agriculture, particularly potato farming. Other surrounding watersheds have agriculture taking place, but just not as much. These farming practice largely influence the water quality in the area, especially Springbrook Creek that is on the list of impaired waters of the state.

The Headwaters Basin includes a large and diverse component of Wisconsin's northern forest. Natural forests dominate the landscape and offer significant contribution to the life styles, cultures and traditions, economic vitality, recreational opportunities, and ecological values held in high regard by citizens of this Basin. A variety of land uses occur across the region but forestland dominates the existing land use across most counties (Table 2).

Table 2. Area of Forest Land by County. (1996 Acres)

<u>County</u>	<u>Total Forest</u>	<u>% Forest</u>	<u>Total Land Area</u>
Florence	272,700	87	312,400
Forest	592,600	91	649,100
Langlade	409,400	73	558,600
Lincoln	397,000	70	565,200
Oneida	573,600	80	719,800
Vilas	466,100	84	558,600

Source: Wisconsin Forest Resource Statistics, 1996. USFS Resource Bulletin NC-183

As elsewhere in Wisconsin, most of the lands including forested lands are privately owned but unlike many other Basins, a significantly higher

proportion occurs under municipal, county, state, or federal ownership. Large County Forests, the Northern Highland-American Legion State Forest, the Chequamegon-Nicolet National Forest, and tribal-owned lands account for most of this public forest ownership in this basin.

Figure 4 shows public land locations throughout the Headwaters Basin and Table 3 give acres of public land.

In addition to the public lands, there are several large industrial forest ownership's

(Kretz Lumber Co., Champion International Corp., Lake Superior Land Co., Tomahawk Timbers Lands, and Stora Enso) within the Headwaters Basin.

Figure 7. Public Lands in the Headwaters Basin

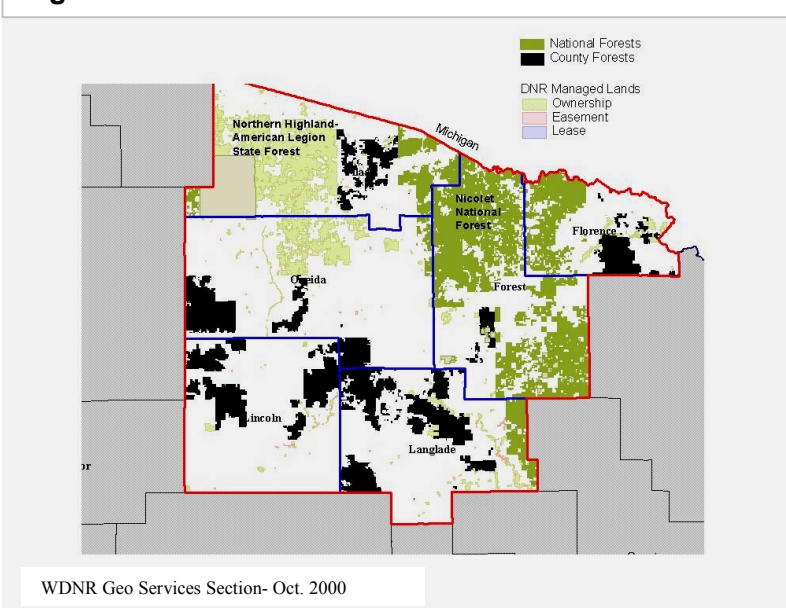


Table 3. Total Public Land Acreage by County in Headwaters Basin.

COUNTY	NATIONAL FOREST	STATE FOREST	COUNTY AND MUNICIPAL	TOTAL
Florence	71,600	12,500	32,200	116,300
Forest	305,000	10,000	10,848	325,848
Langlade	29,100	20,500	130,400	180,000
Lincoln	0	3,500	87,900	91,400
Oneida	10,900	58,500	74,200	143,600
Vilas	45,700	126,600	38,000	210,300
Total	462,300	231,600	373,548	

Wisconsin Forest Resource Statistics, 1996. USFS Resource Bulletin NC-183

The following table shows the percentage of public vs. private land in the Headwaters Basin. Both Forest and Vilas Counties show that there is more public than private land in their counties.

Table 4. Timberland Ownership by County (December 31, 1999) (acres)

<u>County</u>	<u>Total Public</u>	<u>% Public</u>	<u>Total Private</u>	<u>% Private</u>	<u>Total Timberland Area</u>
Florence	116,300	41	165,500	59	281,800
Forest	325,848	57	240,500	43	566,348
Langlade	180,000	44	229,400	56	409,400
Lincoln	91,400	23	305,200	77	396,600
Oneida	143,600	25	424,200	75	567,800
Vilas	210,300	50	214,100	50	424,400

Source: Wisconsin Forest Resource Statistics, 1996. USFS Resource Bulletin NC-183

The following table describes the acreage of private forestland currently enrolled under the forest tax law programs in counties in the Headwaters Basin: (See Forest Management Core Work Section for details about these programs).

Table 5 Lands Enrolled under the Managed Forest Law and the Forest Crop Law (9/2000)

<u>County</u>	<u>Managed Forest Law</u>	<u>Forest Crop Law</u>
Florence	67,926 acres	4,979 acres
Forest	110,496	10,082
Langlade	76,700	6,162
Lincoln	63,749	49,128
Oneida	181,289	23,640
Vilas	29,604	9,593

Bureau of Forestry-2000

This forested landscape provides many opportunities for the Department to sustain the natural resources and protect the health and safety of people living or visiting the Headwaters Basin.

LAND RESOURCES

Biological Communities

Biological communities are defined and described based on a variety of factors including geographic location, species composition, topography, moisture, temperature, soils and climate. Natural factors, especially the glaciers but also windstorms, fires, drought, and floods, shaped Wisconsin's landscape. Euro – American settlement brought many changes to the landscape, including suppression of fire, large-scale intensive agriculture, and urban and industrial development.

The WDNR publication, *Wisconsin's Biodiversity as a Management Issue* (WDNR, 1995) describes seven biological communities. These communities are an aggregation of more numerous communities described by scientists in the 1950's. Identifying these communities and their biological diversity helps the Department achieve its goal of managing for sustainable ecosystems.

A community can range in size from less than an acre to thousands of acres. The Headwaters Basin contains components of five of seven biological communities: northern forests, Pine Barrens, grasslands, wetlands, and aquatic systems (wetlands and aquatics systems are discussed in the water sections of this report). More detailed descriptions can be found in *Wisconsin's Biodiversity as a Management Issue – Pub –RS-915 95* and *Ecological Landscapes of Wisconsin* still under development.

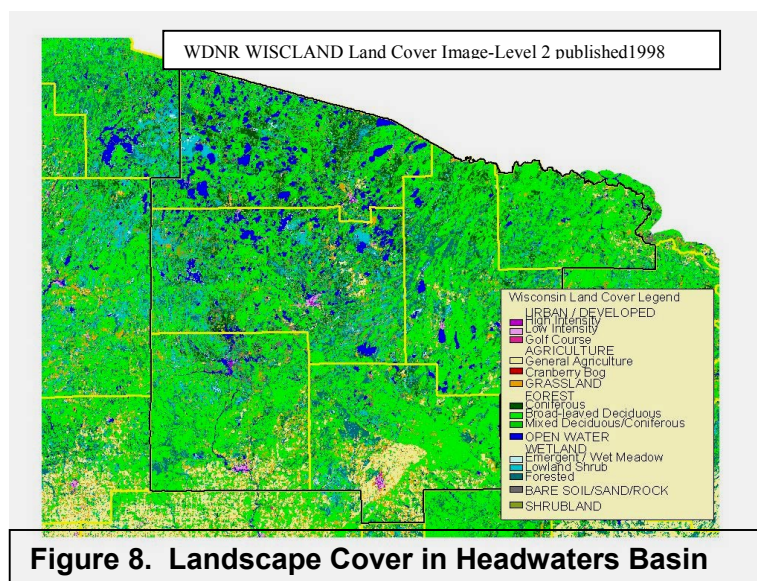


Figure 8. Landscape Cover in Headwaters Basin

Northern Forest

Northern forest is the predominant community in the Headwaters Basin (Figure 5). It contains mixed deciduous and coniferous forests found in a distinct climatic zone that occurs north of a roughly S – shaped transition belt known as the “tension zone” that runs from northwest to southeast Wisconsin. Early forest surveys indicate that northern forests consisted of a mosaic of young, mature, and “old growth” forests composed of pines, maples, oaks, birch, hemlock, and other hardwood and conifer species. “Old growth” is defined as a community in which the dominant trees are at or near biological maturity.

Pine Barrens

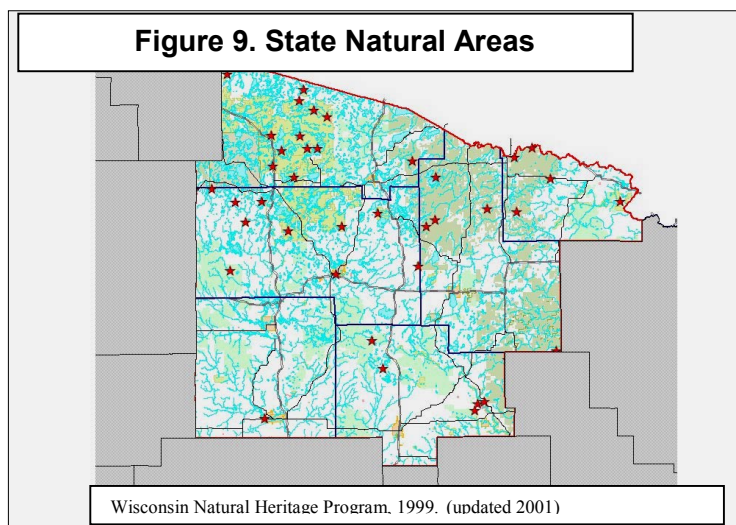
Small fragments of Pine Barrens are found in the northeast corner of the Headwaters Basin in Florence County. In its savanna form, the barrens are plant communities that occur on sandy soils and are dominated by grasses, forbs, low shrubs, small trees, and scattered large trees. One consistent element of all barrens is their dependence on fire. The most common tree of Pine Barrens is the jack pine, but red pine may also be present, and Hill’s oak is usually present as a shrub or as a scattering of larger trees. Bracken grasslands are a component of some northern Pine Barrens where frost pockets limit tree reproduction and vegetation is characterized by blueberries, bracken fern and sweet fern. Fragments of bracken grasslands are found in central Vilas County, within the Headwaters Basin. The barren is a tenuous community pulled in opposing directions by fire, frost and succession. Depending on the degree of disturbance and time since disturbance, the barrens community can range in composition from open lands comprised of grasses, shrubs and tree sprouts to savannas to closed canopy forests.

Grassland

Grasslands are uncommon in the Headwaters Basin. Abandoned agricultural fields are present in some areas. Native bracken grasslands are confined to very small, scattered remnants. Most old existing fields are succeeding to forests or are being planted with trees.

STATE NATURAL AREAS

Landscapes in Wisconsin have experienced dramatic changes over the last 100 years or so, since the times of the early settlers. There are very few areas in the state that are being preserved to protect their aesthetic beauty and natural values. 1951 was the year that



conservationists realized Wisconsin was losing too many valuable areas of natural communities, and the first state program in the U.S. was established to preserve these areas. State Natural Areas (SNA's) are areas that are to be protected for their natural settings and communities, including rare species. SNA's are also areas set aside for scientific research and environmental education. Excessive use of these areas can be damaging, therefore,

environmental education and conservation group use is limited to about 60 of the least fragile sites in the natural areas system. Recreational activities are not allowed. There are currently 40 SNA's in the Headwaters Basin, which include a variety of different habitats (Figure 6, Table 6).

Table 6. State Natural Areas in Headwaters Basin

COUNTY	STATE NATURAL AREA	COUNTY	STATE NATURAL AREA
Florence	Fox Maple Woods	Oneida	Rice Lake-Thunder Lake Marsh
Florence	Spread Eagle Barrens	Oneida	Holmboe Conifer Forest
Florence	Grandma Lake Wetlands	Oneida	Wind Pudding Lake
Florence	Wisconsin Slough	Oneida	Patterson Hemlocks
Florence	Brule River Cliffs	Oneida	Squirrel River Pines
		Oneida	Finnerud Pine Forest
Forest	Scott Lake-Shelp Lake Natural Area	Oneida	Gobler Lake
Forest	Giant White Pine Grove	Oneida	Stone Lake Pines
Forest	Atkins Lake	Oneida	Atkins Lake
Forest	Bastille Lake	Oneida	Tomahawk River Pines
Forest	McCaslin Mountain		
Forest	Bose Lake Hemlock-Hardwoods	Vilas	High Lake Spruce-Balsam Forest
Langlade	Bogus Swamp	Vilas	Plum Lake Hemlock Forest
Langlade	Monito Lake	Vilas	Bittersweet Lakes
Langlade	Flora Spring Pond	Vilas	Black Tern Bog
Langlade	Oxbow Rapids, Upper Wolf River	Vilas	Johnson Lake Barren
Langlade	Bear Caves	Vilas	Aurora Lake
		Vilas	Goodyear Springs-East
Lincoln	Krueger Pines	Vilas	Day Lake
		Vilas	Pine-Oak Grove
		Vilas	Trout Lake Conifer Swamp
		Vilas	Escanaba Lake Hemlocks
		Vilas	Dunn Lake
		Vilas	Mary Lake

Wisconsin Natural Heritage Program, 1999. (updated 2001) & WDNR-State Natural Areas by County (1999)

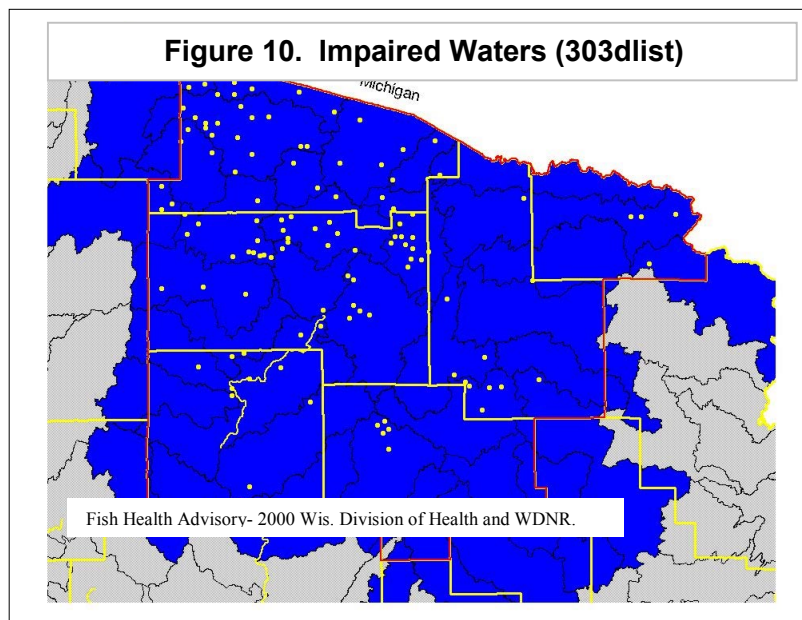
WATER

The Headwaters Basin contains a greater percentage of open water than most other areas of the state. The Basin contains 34% of all the state's named and unnamed lakes and 22% of the total lake acreage. Of the 15,057 lakes in Wisconsin, 5,098 are in the Headwaters Basin with over 3,000 of those being small unnamed lakes. Pelican Lake, Oneida County, is the largest lake in the Headwaters Basin at 3,585 acres. Approximately 58% of all the lakes larger than 10 acres in size in the Headwaters Basin are seepage lakes, followed by drainage (27%), spring (10%) and drained (4%). Besides the abundance of lakes there are approximately 3,895 miles of streams and rivers that vary in biological use from small warm and cold water streams to large rivers. The Wisconsin River is the largest waterway in the Headwaters Basin. It originates at Lac Vieux Desert, which lies in both the Upper Peninsula of Michigan and Vilas County in Wisconsin. 139 of the Wisconsin's 420 miles flows north to south through Vilas, Oneida and Lincoln Counties before it leaves the Headwaters Basin approximately four miles south of Merrill. Many of the streams, and several of the lakes in the Headwaters Basin are classified as either Exceptional Resource Waters (ERW) or Outstanding Resource Waters (ORW) (Appendix 1). ORW waters have excellent water quality and high-quality fisheries. They do not receive

wastewater discharges, and any future point source discharges will not be allowed unless the quality of such discharges meets or exceeds the quality of the receiving water. ERW's have excellent water quality and valued fisheries but may already receive wastewater discharges or may receive future discharges necessary to correct environmental or public health problems. There are approximately 33,587 acres of lakes and 960 miles of streams and rivers that are considered either ERW or ORW water.

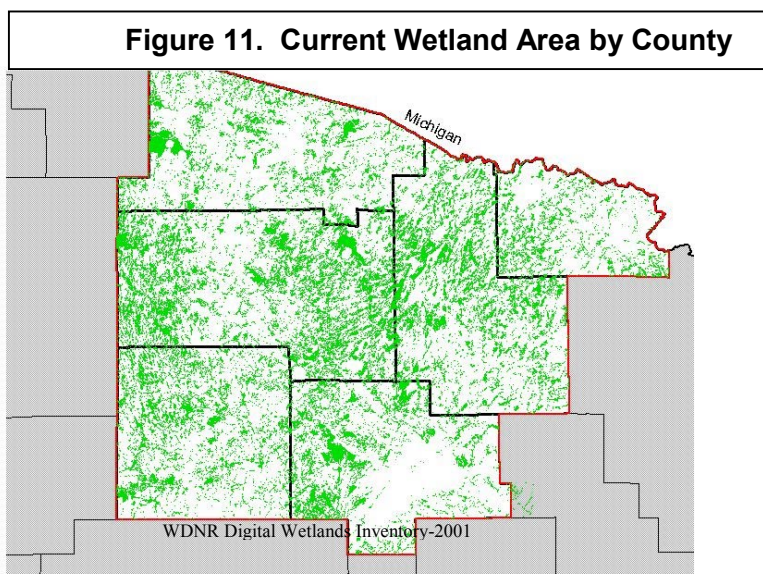
IMPAIRED WATERS

Even though the Headwaters Basin contains many lakes, streams and rivers classified as ERW and ORW waters, 49 miles of the Wisconsin River (42 miles between Rhinelander and Grandfather Dam and 7 miles between the Merrill Dam and the Lincoln County line), 4.3 miles of Springbrook Creek, and 119 lakes (mercury fish health advisory lakes) are listed on the state (303d list) of impaired waters. Figure 7 shows locations of impaired waters and Appendix 2 lists these water bodies. Waters found on this list are impacted by point and non-point sources of pollution and mercury contamination, and as a result, are not meeting specific water quality standards. Since there is special concern for these waterbodies, they receive higher a priority for water monitoring now and in the future.



WETLANDS

According to the Clean Water Act, wetlands refer to “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Swamps, marshes, bogs, just to name a few, are all types of wetlands. Between the 1780's and 1980's Wisconsin has lost an estimated 50% of its total wetland acreage due mostly to human activities such as dredging, drainage, logging, mining, construction, and discharges of toxic substances. Wetlands have many different functions, and thus provide a vital role in any ecosystem. Wetlands serve as a source of food and habitat for a variety of birds, mammals, reptiles, and amphibians. They also reduce the likelihood of flood damage to crops in agricultural



regions, help control runoff in urban areas, and buffer shorelines against erosion. Possibly most important, wetlands act as a sponge and intercept surface runoff, and breakdown organic wastes and pollutants. The overall goal is to protect those wetlands that are still in existence (Figure 8). Table 7 lists present wetland acreage by county for the Headwaters Basin.

Table 7. Current Wetland Acreage by County

County	Total Surface Area (Acres)	Acres of Wetland	% of County Mapped As Wetland	Wetlands as % of Statewide Total
Florence	319,360	49,974	15.6%	.9
Forest	673,430	161,056	23.9%	3.0
Langlade	569,128	108,800	19.1%	2.0
Lincoln	584,960	121,530	20.8%	2.3
Oneida	779,047	237,546	30.5%	4.4
Vilas	554,880	116,866	21.1%	2.2
TOTAL	3,480,805	795,772		14.8

Bureau of Fisheries Management and Habitat Protection-2001

Table 8. Wetland Types and Associated Acreage for the Headwaters Basin.

Wetland Types	Acreage
Aquatic beds	4,784
Deep water lake	3,380
Emergent/wet meadow	25,973
Flats/unvegetated wet soil	995
Forested	402,542
Scrub/shrub	166,186
Wet	185,650

Summary of Wetland Types from Digital Wetlands Data-WDNR-2001

ENDANGERED RESOURCES

The Headwaters Basin is home to many of Wisconsin's threatened and endangered species. The Wisconsin Natural Heritage Inventory documents endangered, threatened, and special concern species by county for the entire state. Endangered species are those species that continued existence in the state is in jeopardy. Threatened species are those species that appear likely to become endangered. Special concern species are those for which some problem of abundance or distribution is suspected but not yet proven.

Wildlife management staff is responsible for a variety of actions aimed at helping populations of at risk species within the Basin. Property acquisition is a valuable tool that allows staff to permanently protect critical habitats. Land is acquired as Natural Areas, and Wildlife Areas throughout the Basin. Habitat restoration, modification and maintenance are the other tools used to provide the necessary elements needed by threatened and endangered species. Habitat maintenance, wetland restoration, prescribed burning, water level management, and invasive species control are practices that allow for the needs of these at risk species to be met. Refer to Appendix 3 for a complete listing of endangered and threatened species in the Headwaters Basin.

WILDLIFE RESOURCES

In general, the wildlife of the Headwaters Basin is typical of the farm fringe and forested regions of northern Wisconsin. However, there are some features of the Headwaters Basin that make it unique for wildlife.

The large number of lakes, rivers and wetlands provide habitat for the most concentrated populations of bald eagles, ospreys, common loons, and river otters in the region. These aquatic communities also support a large population of beaver, colonial nesting water birds such as the great blue heron, and waterfowl.

Large forested blocks provide habitat for a wide variety of songbird species, including forest interior and area sensitive species, as well as mammals such as gray wolf, bobcat, black bear and fisher. Within the Headwaters Basin there are 29 known species of Threatened/Endangered species of wildlife, including the gray wolf, populations of American marten and spruce grouse, osprey and red-shouldered hawk as well as other birds, aquatic and terrestrial insects, mussels, fishes, amphibians and reptiles.

EXOTIC SPECIES

Numerous exotic plant and animal species have been introduced into the Great Lakes since the 1800's. Several of these species have invaded Wisconsin inland waters causing ecological problems. Some of these exotics have caused more problems than others.

Carp, rusty crayfish, purple loosestrife, Eurasian watermilfoil, smelt, swimmers itch, and

curlyleaf pondweed, are all exotics that have impacted Wisconsin's waters one way or another. (Eurasian watermilfoil and purple loosestrife are the exotics that the most time and effort has been spent on for controlling in the Headwaters Basin.) Zebra mussels are currently being monitored for, but there has not yet been a confirmed introduction into Headwater Basin lakes. Eurasian watermilfoil spreads so easily and grows so fast that it can choke out a lake. Figure 9 shows locations of known lakes that currently contain Eurasian watermilfoil, and Table 8 lists the names of lakes and the exotics found within

each lake. Purple loosestrife can take over a wetland area preventing other native species from growing. The zebra mussel can take over populations of native mussels, and can have the potential of decreasing the amount of oxygen in the water. The spiny water flea, round goby, ruffe, and white perch are other exotics currently in the Great Lakes, that also have the potential of invading Wisconsin inland waters.

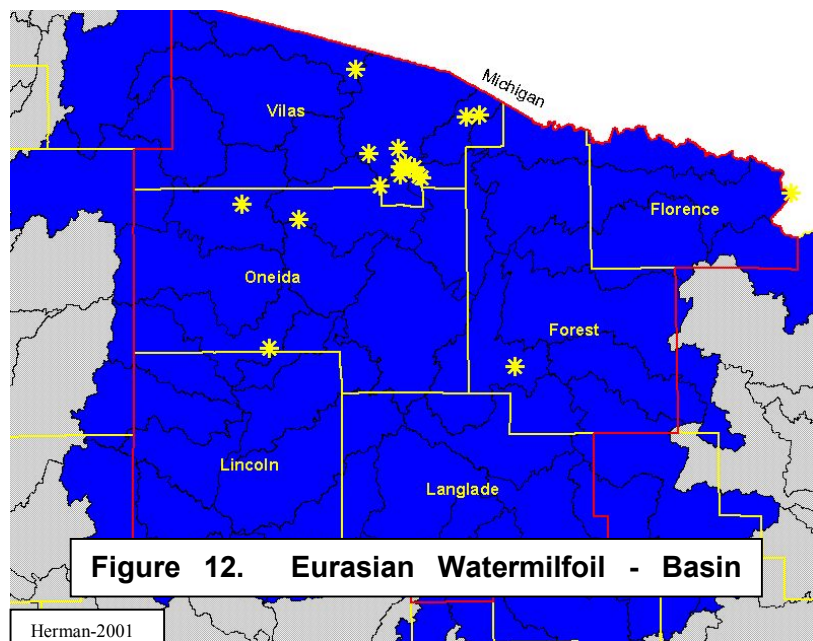


Table 9. Exotic Species Found in Headwaters Basin. (Herman-2001)

FLORENCE COUNTY	RUSTY CRAYFISH	CURLYLEAF PONDWEED	PURPLE LOOSESTRIFE	EURASIAN WATERMILFOIL	SWIMMERS ITCH	SMELT
Keyes Lake						X
Twin Falls Flowage				X		
FOREST COUNTY						
Birch Lake	X					
Butternut Lake	X					
Franklin Lake	X					
Hiles Millpond			X			
Kentuck Lake	X	X	X			
Lily Lake	X					
Lucerne Lake (Stone)			X		X	X
Mentonga Lake	X			X		
Pickere! Lake			X			
Roberts Lake	X					
Trump Lake	X					
Peshtigo River	X					
Brule River	X					
Brule Creek	X					
LANGLADE COUNTY						
Antigo Lake		X				
Enterprise Lake					X	
Jessie Lake (Kentuck)			X			
Kimball Lake			X			
Post Lake (Lower)			X			
Post Lake (Upper)			X			
Sawyer Lake (Edith)			X			
LINCOLN COUNTY						
Bridge Lake					X	
Clear Lake					X	
Crystal Lake					X	
Mohawkskin Lake			X			
Nokomis Lake		X	X			
Rice River Flowage		X	X			
Spirit River Flowage			X			
Ward Mill Pond			X			
ONEIDA COUNTY						
Bass Lake (T38N R09E S12)			X			
Bearskin Lake	X					
Big Carr Lake	X		X			
Big Fork Lake	X					
Big Stone Lake	X					
Boom Lake					X	
Buffalo Lake			X			
Bullhead Lake (T39N R06E S11)			X			
Carrol Lake	X					
Chain Lake	X		X			
Cranberry Lake (T39N R11E S06)	X					
Crescent Lake (T36N R08E S21)	X					
Crystal Lake (T37N 09E S06)	X					

Dam Lake	X		X			
ONEIDA COUNTY (CONT'D)	RUSTY CRAYFISH	CURLYLEAF PONDWEED	PURPLE LOOSESTRIFE	EURASIAN WATERMILFOIL	SWIMMERS ITCH	SMELT
Deer Lake (38N R11E S10)	X					
Dog Lake (38N 11E S15)	X				X	
Echo Lake	X		X			
Fourmile Lake	X					
Hasbrook Lake	X					
Horsehead Lake (Leta)		X				
Horsehead Lake (East)			X			
Indian Lake (T38N R09E S01)					X	
Island Lake (T39N R11E S29)	X					
Julia Lake (38N R12E S06)	X					
Katherine Lake			X			
Kaubashine Lake (Lower)	X					
Kaubashine Lake (Upper)	X					
Kawaguesaga Lake	X		X		X	
Laurel Lake (Medicine)	X					
Little Carr Lake			X			
Little Fork Lake	X					
Little Tomahawk Lake	X					
Long Lake (T39N R11E S08)	X					
Madeline Lake (Mud)	X					
Manson Lake		X		X		
Maple Lake					X	
McCormick Lake				X		
Mercer Lake	X					
Mid Lake (Nawaii)	X		X			
Minocqua Lake	X	X	X	X	X	
Nokomis Lake		X	X			
Oneida Lake	X					
Pelican Lake	X				X	
Planting Ground Lake	X					
Rainbow Flowage	X		X	X		
Rangeline Lake	X					
Rice River Flowage		X	X			
Round Lake (T39N R11E S29)	X					
Sand Lake (T39N R09E S20)	X		X			
Sevenmile Lake	X					
Squaw Lake	X					
Squirrel Lake	X		X			
Stone Lake (T38N R09E S05)	X					
Swampsauger Lake			X			
Sweeney Lake			X			
Tomahawk Lake	X	X			X	
Townline Lake (T39N R11E S31)	X					
Venus Lake			X			
Whitefish Lake	X					
Willow Flowage	X					
VILAS COUNTY						
Alder Lake	X					
Amik Lake (Rice,Pike)			X			
Averill Lake (Mud)	X					
Bass Lake			X			

Big Arbor Vitae Lake	X					
Big Lake (T42N R06 S04)	X					
VILAS COUNTY (CONT'D)	RUSTY CRAYFISH	CURLY LEAF PONDWEED	PURPLE LOOSESTRIFE	EURASIAN WATERMILFOIL	SWIMMERS ITCH	SMELT
Big Muskellunge Lake	X					
Big Sand Lake				X		
Big St. Germain Lake					X	
Boot Lake (T40N R09E S02)				X		
Boulder Lake	X		X			
Catfish Lake	X		X	X		
Clear Lake	X					
Cranberry Lake	X					
Crystal Lake (T41N R07E S27)						X
Duck Lake	X			X		
Dunn Lake			X			
Eagle Lake (T40N R10E S22)	X			X		
Fence Lake					X	X
Island Lake	X		X			
Kentuck Lake	X	X	X			
Little Arbor Vitae Lake	X					
Little St. Germain Lake		X				
Little Star Lake (T42N R05E S15)	X					
Long Lake				X		X
Manitowish Lake	X					
Muskellunge Lake	X		X			
Otter Lake	X			X		
Plum Lake	X					
Presque Isle Lake	X					
Rest Lake	X			X		
Scattering Rice Lake	X			X		
Sparkling Lake (Silver)	X		X			X
Spider Lake	X					
Squirrel Lake	X		X			
Star Lake	X					
Stepping Stone Lake #3			X			
Stone Lake	X					
Stormy Lake			X	X		
Trout Lake			X			
Turner Lake	X					
Twin Lake (North)					X	
Twin Lake (South)					X	
Van Vliet Lake	X					
Voyageur Lake	X			X		
Watersmeet Lake	X			X		
Wild Rice Lake (Halfway)	X		X			
Yellow Birch Lake	X		X	X		

POINT SOURCE DISCHARGE LOCATIONS

Table 9 is a list of point source discharge locations for wastewater in the Headwaters Basin. Each of these discharge locations are also located on their respective watershed map.

Table 10. Point Source Discharge Locations

(WDNR Northern Region-Wastewater Management Program)

POINT SOURCE DISCHARGE LOCATIONS	GROUND or SURFACE	MUNICIPAL or INDUSTRIAL
RHINELANDER PAPER CO. COMBINED OUTFALL	S	I
ARTHUR OEHMCKE FISH HATCHERY SEEPAGE	S	I
TENNECO PKG	S	I
WI DNR CRYSTAL SPRINGS	S	I
POLAR ENTERPRISES (CAFO)	G	I
WI DNR LANGLADE REARING STATION	S	I
WELLS SHELL STATION	S	I
SUMMIT LAKE LAUNDROMAT	G	I
ANTIGO CHEESE	S	I
BOULDER JCT LAUNDROMAT	G	I
THREE LKS SAN DIST #1	S	M
CITY OF RHINELANDER	S	M
LAKELAND SAN DIST #1	G	M
CITY OF TOMAHAWK	S	M
CITY OF MERRILL	S	M
LINCOLN HILLS SCHOOL	S	M
TOWN OF RUSSELL SAN DIST #1	S	M
WABENO SANITARY DISTRICT #1	S	M
CITY OF CRANDON - SEEPAGE CELLS DISCHARGE	G	M
LAONA SANITARY DIST #1	S	M
LAND O' LAKES SAN DIST. #1	S	M
EAGLE RIVER SEWER&WTR UTIL	S	M
PHELPS SAN. DIST. #1	S	M
LAKE TOMAHAWK	S	M
WHITE LAKE VILLAGE OF	G	M
ANTIGO CITY OF	S	M
ELCHO SD #1	G	M
CITY OF ANTIGO	S	M
CONSERVE SCHOOL	G	M
DAIRYMEN'S COUNTRY CLUB	G	M
FLORENCE WWT	G	M
AURORA S.D.	S	M

DAMS

Thousands of large and small dams have been built on Wisconsin streams and rivers over the last 150 years or so for a variety of different purposes. There are currently a total of 213 dams in the Headwaters Basin (Table 10), and of these 86 appear in the dam inspection inventory as large dams. These dams should be inspected every ten years. The total of 86 is a bit misleading because it includes 34 FERC dams that are not in our jurisdiction and 10

USDA dams that have their own inspection program. Each FERC license has many conditions designed to protect Public Interest values. Department staff review and comment on all re-license cases and work with the licensee after licensing to insure adequate implementation of each condition in the license. This includes annual inspections (with FERC) and consultation with the dam owners to resolve any Public Trust issues. Since October 1999, 19 dam approvals have been issued, which have included reconstructions of large dams on navigable waters, but the majority have been brand new small dams on non-navigable waters. Many dams have become unrepairable without considerable cost, becoming a safety hazard to downstream communities as well as to those using the river for recreation. Routine operation and maintenance of dams is expensive, and in many cases, maintenance is neglected. Impoundments created by dams do provide recreational and wildlife opportunities, but they can also create many environmental problems. Dams impound free flowing streams and rivers, destroying riverine characteristics, prevent fish migration, accumulate sediment, increase water temperatures above the dam during the summer and decrease downstream temperatures during the winter. These fluctuating water temperatures and increased sedimentation can also cause many water quality problems. Dam locations are shown on the watershed maps.

Table 11. Large and Small Dams in the Headwaters Basin.

(Waters Tracking Database-Wisconsin Dams Inventory-2001)

COUNTY	DAM NAME	COUNTY	DAM NAME	COUNTY	DAM NAME
Florence	Mud Creek	Forest	Lily lake	Langlade	Phlox
Florence	Nilson, Stanley No.2	Forest	Bog Brook	Langlade	Oxbo Flowage
Florence	Nilson, Stanley No.1	Forest	Roberts Lake	Langlade	North Grade
Florence	Nilson, Stanley No. 3	Forest	Above Bog Brook	Langlade	Langlade County Flowage
COUNTY	DAM NAME	COUNTY	DAM NAME	COUNTY	DAM NAME
Florence	A-H Conservation Club	Forest	Rusch Dam	Langlade	Motl 3
Florence	Herzog, Gordon	Forest	Pichotta, Harold A.	Langlade	Langlade County Flowage
Florence	Swanson, Arthur	Forest	Pichotta, H.A.	Langlade	Upper Wicke
Florence	Ringblom, Gunnard	Forest	Deer Creek	Langlade	Lower Wicke
Florence	Hammerlund, Rolland S.	Forest	Knowles Creek	Langlade	Tower Seep
Florence	Hammerlund, Rolland S.	Forest	Swamp Creek	Langlade	Skunk Creek
Florence	Hammerlund, Rolland S.	Forest	Davison, Evron E.	Langlade	Gleason
Florence	Powers Dam	Forest	Metonga Lake	Langlade	County Line
Florence	Long Lake	Forest	Schlafke, Theodore	Langlade	Motl1
Florence	Woods Creek	Forest	Adams, Herbert	Langlade	Motl 2
Florence	Dallagrana, Walter	Forest	Little Rice Creek	Langlade	Middle Trappe Flowage Dam
Florence	Lake Emily	Forest	Connor Forest Industries	Langlade	Skinner
Florence	Pine River	Forest	Forster Muller Lumber Co.	Langlade	Faust
Florence	Halls Creek Wildlife Flowage	Forest	Pine Lake Outlet	Langlade	Upper Antigo
Florence	South Lake	Forest	Wildcat Creek	Langlade	Lower Antigo
Florence	Ford	Forest	Coyote Creek	Langlade	Mcgee Dam
Florence	Keyes Lake	Forest	Klescewski, Leonard No.2	Langlade	Langlade Fish Hatchery
Florence	Denell, John	Forest	Hay Meadow Creek	Langlade	White Lake
Florence	Brule	Forest	West Allen Creek	Langlade	Ormsby
Florence	Verley, Ray	Forest	Alvin Creek	Langlade	Neva Dam
Florence	Laird, Kenneth L	Forest	Briss Lake	Langlade	Greater Bass Lake
				Langlade	Deep Woods Lake
Lincoln	Alexander	Oneida	South Pelican	Langlade	Langlade Co. Forest Flowage
Lincoln	Merrill	Oneida	Little Rice River	Langlade	Langlade Co. Forest Flowage
Lincoln	Robl,Tony	Oneida	Shot and Hook Club	Langlade	Crystal Springs Fish Hatchery

COUNTY	DAM NAME	COUNTY	DAM NAME	COUNTY	DAM NAME
Lincoln	Schleif, Theodore	Oneida	Felser, Carl R.	Langlade	Crystal Springs Fish Hatchery
Lincoln	Klebenow	Oneida	Swamp Lake	Langlade	Hanke
Lincoln	Gatterman, Clifford	Oneida	Oneida Lake	Langlade	Sheldons
Lincoln	Carl	Oneida	Hancock Lake	Langlade	Fish
Lincoln	School Dam	Oneida	Jennie Creek	Langlade	Upper Post Lake
Lincoln	Lincoln Co. Sports	Oneida	Hat Rapids	Langlade	Glen Acre Springs Dam
Lincoln	Ruzon, John R.	Oneida	Rhineland	Langlade	Spider Creek
Lincoln	New Wood	Oneida	Midget Lake Outlet	Langlade	Pickere Lake
Lincoln	Trapper Morrison	Oneida	George Lake		
Lincoln	Camp 26	Oneida	North Pelican Lake	Vilas	Flambeau Lake
Lincoln	Grandmother Falls	Oneida	Willow Region	Vilas	Squaw Lake
Lincoln	Upper Grandfather Falls	Oneida	Willow River Reservoir	Vilas	Fence Lake Canal
Lincoln	Tug Lake	Oneida	Laux	Vilas	Big Arbor Vitae
Lincoln	Richard Geiss	Oneida	Spuce Lake	Vilas	Little Arbor Vitae
Lincoln	Doering	Oneida	Skunk Lake	Vilas	Winat (Gone)
Lincoln	Wedler	Oneida	Lake Katherine	Vilas	Town of St. Germain
Lincoln	Tomahawk	Oneida	Hazelhurst Canal	Vilas	Lost Lake
Lincoln	Spirit R. Reservoir	Oneida	Horsehead	Vilas	Found Lake
Lincoln	Hilgendorf, Lloyd	Oneida	Two Sisters Lake	Vilas	Lake Content
Lincoln	Stole Lumber Co	Oneida	Fredrichs	Vilas	Big St. Germain
Lincoln	Little Somo River	Oneida	Thunder Lake	Vilas	Little St. Germain
Lincoln	Rice	Oneida	Sowinsky, Henry No. 1	Vilas	Muskellunge Lake
Lincoln	Clear Lake	Oneida	Sowinsky, Henry No. 2	Vilas	Lake McDonald Dam
Lincoln	Half Moon Lake	Oneida	Maple Lake	Vilas	Otter Rapids
Lincoln	Kings	Oneida	Scott Creek	Vilas	Range Line
Lincoln	Jersey	Oneida	Franklin Lake	Vilas	Tambling Lake
Lincoln	Harrison	Oneida	Squirrel Lake	Vilas	Spring Meadow Creek
Lincoln	Pinten	Oneida	Minocqua	Vilas	Cranberry Lake
		Oneida	Fish Hatchery	Vilas	Sherman Lake Pool
Vilas	Twin Lakes	Oneida	Gilmore Lake	Vilas	Chewelak Lake Pool
Vilas	Little Deerskin Lake	Oneida	Pickere Control	Vilas	White Sand Lake
Vilas	Long-on-Deerskin	Oneida	Pickere Canal	Vilas	Stevenson Creek
Vilas	Rest Lake	Oneida	Rainbow Reservoir	Vilas	Mann Lake
Vilas	Powell Marsh W.A. Pool	Oneida	Sugar Camp	Vilas	Mann Creek
Vilas	Powell Marsh W.A. Pool	Oneida	Rice Lake	Vilas	Plum Lake
Vilas	Powell Marsh W.A. Pool	Oneida	Rangeline Lake Dam	Vilas	Bear Springs Flowage
Vilas	Powell Marsh W.A. Pool	Oneida	Lower Ninemile	Vilas	Star Lake
Vilas	Whitney Flowage	Oneida	Burnt Rollways	Vilas	Buckatahpon
Vilas	Fishtrap	Oneida	Seven Mile	Vilas	Stateline
Vilas	Escanaba Lake			Vilas	Little Horsehead Lake
Vilas	Kenu Lake	Vilas	Hayes, H.W.	Vilas	Presque Isle Rearing Pond
Vilas	Little Tamarack Creek	Vilas	Mill Lake		
Vilas	Little Tamarack Creek-U	Vilas	Mcfadyen		
Vilas	Little Tamarack Creek				
Vilas	Eleanor Lake				
Vilas	Lac Vieux Desert				
Vilas	Turtle Lake				

RECREATION

People flock to the Headwaters Basin 12 months a year to partake in the abundant recreational opportunities of this area. Visitors from Wisconsin and many other states, and nations come here to seek a wide range of recreational opportunities on the region's lakes, rivers, and public and private lands. Tourists visiting Oneida and Vilas Counties spent an estimated \$350 million last year (December 1999 to November 2000). People come for "quiet" activities such as hiking, fishing, and bird watching and cross-country skiing. Visitors also use the state, federal, county, tribal and private forests and lakes, rivers and streams of the basin for hunting and for motorized activities like snowmobiling and power boating, as well as fishing and canoeing. Whether they are campers or day visitors, whether they hike or bike, visitors want and expect certain things from the area and from the people they share the resources with.

Outdoor Recreation

Surveys show that the most popular outdoor recreation activities of Wisconsin residents are swimming, wildlife viewing and picnicking followed by biking, fishing and nature study/bird watching. The fewest number of people ride horseback, jet ski or sail. (State Forest Recreation Assessment, Watkins et al, 2001)

Demographers forecast increases in the number of participants in nearly all types of outdoor activities. Over the next 10 years an aging Wisconsin population is expected to increase demand for activities popular with older adults. These activities are the more passive and environmentally appreciative forms of recreation, such as watching birds and wildlife, nature study and nature photography. Presently, these activities combined represent the largest number of participants in Wisconsin outdoors-recreational activities and are likely to increase their dominance in the future. Several more active sports, which are commonly thought of as the domain for younger participants, show the greatest estimated percent increase in participation. These are jet skiing (24 percent), canoeing (19 percent), cross-country skiing (15 percent) and ATV riding (14 percent).

Increasingly, communities are looking for ways to connect with one another through a system of trails from old abandoned rail beds, to improved pathways through the forest, and links using existing trails. This can be seen in the interest some communities in northern Vilas County have shown in cooperatively linking to one another by a paved hiking and bike trail. These communities have recognized the need for this kind of recreation, and businesses in those communities have grown while renting equipment such as bicycles and roller blades for use on the trail.

Opportunities for solitude will likely become increasingly rare and correspondingly prized in northern Wisconsin with the growth of the number of people participating in outdoor recreation and the surge in popularity of motorized recreation. Maintaining areas that provide quiet, solitary outdoor recreation will become highly important to many recreators.

Regional recreation opportunities in the basin can best be described in terms of camping, trail activities, hunting and wild resource lands and water bases recreation of fishing and boating.

Camping

The regional camping inventory data shows that the public and private sectors each serve a different niche. Private campgrounds provide nearly all of the fully developed and only a small

portion (6 percent) of the modern camping opportunities in the region. The public sector provides the bulk of the modern campsites and all of the rustic and backcountry sites.

Trails

The different recreation providers in the region generally offer similar types of trails, such as biking, hiking, skiing and snowmobile trails. There are, however, differences in the quantity each provide. To a large degree this can be attributed to the relative differences in the size of each provider's land base and their management priorities.

Regionally, state lands are a minor provider of designated trail opportunities. The national forests, particularly the Chequamegon Unit, and the county forests are important providers of snowmobiling and ATV riding opportunities in the region. Almost all state lands in the region are closed to ATV use. The private sector (which includes clubs, non-profit organizations and commercial operations) provides hiking, ski, snowmobile and ATV trails.

Overall, opportunities for trail-type activities on non-designated forest roads and trails on public land far exceed those on designated trails. Most logging roads and other non-designated trails on state, federal and county lands are open to non-motorized recreational uses. ATVs and snowmobiles are limited to designated trails, except that ATVs may be ridden off-trail on part of the Iron County Forest and on about 800,000 acres of the Chequamegon National Forest.

Hunting

The Northern Highland/American Legion State Forest is a relatively small but important provider of public hunting opportunities in the region. Over one half of the 4 million total forested acres in the region are open to public hunting. Because of its large size, the national forest provides the majority of hunting opportunities, with 52 percent of the region's public hunting land. Seventeen percent of public hunting land is county/municipal forest, 16 percent is industrial forest, 7 percent is NH/AL, 5 percent is private non-industrial forest, and 3 percent is other state land.

High and moderate quality habitat for deer includes aspen, oak, jack pine, birch, and balsam fir forest types, and for ruffed grouse includes aspen, paper birch, and balsam fir. In lands open to public hunting in the region, about 50 percent of the forests are high to moderate quality habitat for deer, and about 35 percent are high to moderate quality habitat for ruffed grouse. The NH/AL encompasses a slightly higher percentage of better quality habitats for deer and ruffed grouse compared to other landowners in the region.

Although the NH/AL provides a relatively small amount of land in the region, general observations suggest that hunting pressure per acre is greater there, due to its high visibility, familiarity, and ready access.

Water Based Recreation

Visitors and residents alike are drawn to the water resources of the basin. The basin is blessed with one of the highest concentrations of lakes in the world. Sport fishing is a major recreational use of these water resources. Other popular water oriented recreation includes swimming, water skiing, boating, jet skiing, canoeing and sightseeing.

Wild Resource Recreation

Wild or wilderness recreation emphasizes quiet, solitary experiences with few to no facilities, motors, or signs of management activities. The majority of wild-land recreation opportunities in the region are found on the national forests. The national forests provide over 62,000 acres of

designated wilderness and 16 semi-primitive non-motorized areas that total more than 68,000 acres. The remaining lands with some type of wild resource designation are on state properties: the NH/AL State Forest and the adjacent Flambeau Flowage Scenic Waters Area. The Flambeau Flowage wild area contains just over 2,000 acres.

Recreation Providers

The major public outdoor recreational opportunities in the northern region are found on abundant public land, but certain private forest lands and commercial tourist facilities play a significant role as well. State lands comprise 11 percent of the public recreational lands in northern Wisconsin, with federal, county and private industrial forests making up the remaining 34 percent, 33 percent and 22 percent, respectively. Each provider fills a somewhat different niche. For example, private commercial campgrounds provide nearly all the fully developed, RV type camping. Most of the rustic and primitive style camping is found on national and state forests. While private industrial forestlands are not open to camping, they offer abundant opportunities for hunting, fishing and some other non-motorized uses. County forests are popular hunting areas and, together with the national forests, provide a high percentage of the region's motorized recreational opportunities.

Studies indicate that state forests in particular play a primary role in providing a recreational base for silent-sport activities. In northern Wisconsin participants in silent-sport activities are two and one half times as likely as either motorized recreators or hunters to seek out state lands for their activities. Most hunters use non-industrial private forests while motorized recreators primarily use private and federal land.

CHAPTER 2

LAND, WATER, & FOREST MANAGEMENT PROGRAMS

This plan involves programs in the water, land and forestry divisions of WDNR, all of which will take part in plan implementation. This chapter provides a brief description of the core work conducted by these programs, six of which are located in the Water Division, three are located in the Lands Division, and one is located in the Forestry Division.

WATER DIVISION

BUREAU OF FISHERIES AND HABITAT PROTECTION

Program Title: Fisheries Management

Authority and Funding Sources:

The Department's authority to manage fish and wildlife are found in State statute 20.011 and 20.014. There are more specific authorizations throughout chapters 29 and 23. Administrative rules affecting fishing are found in NR 20-26. Additional authorizations are found in NR 10 through NR 27 and NR 45. Chapters 30 and 31 of Wis. Statutes and Administrative Rules NR 102 and 107 protect aquatic habitat and water quality.

Funding is derived largely from the sale of fishing and hunting licenses, including Trout Stamps that specifically support trout stream habitat enhancement. Also, a federal excise tax on fishing equipment and boats and motors (Federal Aid in Sport Fish Restoration) which is allotted back to states for fish management and public access purposes, contributes to funds.

Core Work:

Fisheries Surveys

- Abundance (population estimates, relative abundance)
- Harvest (creel surveys)
- Evaluate Management Strategies (angling regulations, stocking, habitat improvement)
- Age/growth
- Size Structure
- Habitat

Fish Habitat Improvement/Protection

- Trout stream/spring pond habitat work (Trout Stamp program, private funds)
- Lake habitat improvement (tree drops, cribs, spawning habitat, logs, etc.)
- Shoreland protection/restoration (lake and stream)
- Sensitive Area designations
- Acquisition (input for Fishery Areas, Wild Lakes, shoreland protection)
- Beaver control on trout waters
- *Lake aeration projects
- *Dam removals

Fish Community Manipulation

- Stocking/field transfers
- Angling regulation development/implementation
- *Mechanical removals
- *Chemical treatments

Public/External Relations

- Inquiries from general public
- Organized public groups participation (angling organizations, Lake Associations, etc.)
- School programs
- Conservation Congress meetings
- Governmental (legislators, local government, tribes)
- Other agencies (US Fish and WL Service, US Forest Service, DOT)

Permitting/Regulatory Activities

- Tournament permits (review and issue)
- Bait harvest permits (review and issue)
- Private stocking permits (review, advise, issue)
- Private fish habitat permits (review and issue – cribs, tree drops, halflogs)
- Water regulatory permit review (work with WMS's)
- *Private fish hatchery permitting/inspections
- *Expert testimony in contested case hearings
- *Other permit review (Aquatic Plant Management (APM), Environmental Impact Statement/Environmental Impact Review (EIS/EIR), scientific collectors)

Administrative Activities

- Biennial and special project planning/budget development
- Equipment requests/maintenance
- Hire/train/direct LTE staff
- Maintain professional competence (training, technical meetings, professional societies)

* -indicates less frequent work activities (or smaller portion of total time)

Program Title: Aquatic Habitat Protection (Waterways & Wetlands; Dam Safety, Floodplain & Shoreland Zoning)

Authority and Funding Sources:

Chapters 30 (waterway regulations), 31 (dam regulations), Sections 23.32 (wetlands mapping), 281.31 (shoreland zoning), 87.30 (floodplain zoning).

Funding comes from a variety of sources General Program Revenue (GPR), permit fees, segregated, and federal funds) in the Fisheries and Watershed programs.

Core Work:

Following is a list of basic tasks performed by the aquatic habitat protection staff. Staff members include Water Management (Regulation) Specialists, Zoning Specialists, Rivers (Federal Energy Regulatory Commission-FERC) Specialists, Lakes Specialists, Water Management Engineers, and their assistants (LTEs).

Water Regulation Permits

- Processing permits for activities regulated by Chapters 30 and 31, Wis. Statutes. Examples: shoreline protection, ponds, grading the banks of navigable waterways, structures in navigable waterways.
- Processing water quality certification for proposed Corps of Engineers wetland permits.
- Participating in enforcement actions.
- Monitoring the levels of lakes and flowages.

Zoning Assistance

- Providing biological and technical expertise to local units of government in administration of state mandated shoreland and floodplain zoning ordinances.
- Helping interpret ordinances and making correct land use decisions, including appearing at hearings.
- Reviewing and approving local ordinances and amendments.
- Training local officials and zoning staff.

Rivers Coordination

- Leading the biological review of federal (FERC) licensing of power dams.
- Coordinating other actions related to river management and protection.

Lakes Management

- Providing landowner/lake association/public assistance on all aspects of lake biology.
- Administering the Aquatic Plant Management program.
- Coordinating the region's lake self-help program.
- Processing applications for lake management grants.

Engineering

- Providing engineering evaluations to staff related to permit actions.
- Inspecting dams for structural and public safety, including follow-up with owners and reviewing/approving plans for adequacy.
- Assisting local governments in administering their floodplain management programs including flood hazard mitigation.
- Responding to program related emergencies like flooding and dam failure.

All Staff

- Providing program information to landowners and the public.
- Developing and maintaining case files and computer databases.

BUREAU OF WATERSHED MANAGEMENT**Program Title: Watershed Program****Authority and Funding Sources:**

The Department derives its authority to protect surface water and groundwater from the Federal Clean Water Act and Chapters NR 102, 103, 104, and 105 WI Administrative Code pursuant to s.281.15 (2) (b) State Statutes. These chapters describe water quality standards necessary to protect public rights and interests, health and welfare and present and prospective uses of all waters of the state including: water supplies, propagation of fish and other aquatic life, use by

wild and domestic animals, recreational purposes, preservation of natural flora and fauna, agricultural, commercial, industrial and other uses.

Funds to run this program are provided by the federal government through Clean Water Act funding and through state general program revenues.

Core Work:**Watershed Planning**

- Area wide water quality planning and integrated planning. Areawide planning falls under the authority of the Clean Water Action Section 208 and in Wisconsin NR121 is the implementing regulation. Basin Plans or Water Quality Management Plans have recently been supplanted by Integrated Management Plans. These plans continue to identify water resource issues, problems, and recommendations as well as the existing, potential and codified biological use of the state's waters. Thus, integrated plans continue to function as the basis for 303d listings, 305b assessments, and the framework for consistency reviews by specific regulatory functions such as WPDES permits, facility plans and sewer service area plans.
- Sewer service area planning and approvals. Sewer service area planning also falls under the state regulation NR121. These plans work in close conjunction with the state's facility planning framework as specified in NR110 as they involve an analysis of where and how an area will be served with public sanitary sewer over the ensuing 20 years. These plans also identify areas not suitable for sewered service (i.e., environmentally sensitive areas such as wetlands, streams, lakes, and buffer areas) and thus also serve as a planning and management tool for resource protection.
- Facilities Plan Review Facility plan reviews, conducted under NR110, involve the evaluation of existing and proposed wastewater treatment plant and collection system and design. This critical DNR function also involves performance evaluations (CSO/SSO) and I/I issues.
- 305(b) Water Quality Report to Congress This summary document developed for EPA to report to congress on the state of the nation's waters has two core elements - a narrative portion and a quantitative portion. The narrative portion is derived from program data and integrated plans such as this one; the quantitative portion involves summarizing water quality assessment data located and streams and lakes tables to understand the over all status of water quality in the state.
- Water Quality Grants Program (104(b) and 604(b)) These two grant programs are funded by federal moneys, and in the case of 604b, supplemented by state funds. Both fund water quality related projects, with the caveat that 604b funds primarily fund sewer service area plan development, stormwater planning and related work.
- Outstanding and Exceptional Resource Waters - These waters are identified in NR102 and are protected broadly by the state's anti-degradation framework articulated in various codes and policies (NR105, NR106, NR207), etc. .
- Aquatic Nuisance and Exotic Species Wisconsin DNR is at the forefront of managing aquatic nuisance species. The Water Division Administrator participates on a governor-appointed task force to develop policies and programs to inhibit the spread of the various land and water based species that affect our state's ecology. DNR also has an internal Exotics Team comprised of experts and program staff to identify information needs, develop monitoring strategies and recommendations for action.
- Water Quantity Issues Both Groundwater and state and federal law regarding water quality affect Surface water.

Water Quality Modeling

- Wasteload Allocations
- Contaminated Sediment Monitoring and Transportation Modeling
- TMDL Modeling
- Streams and Lakes Water Quality Modeling
- Mixing Zone Modeling

Water Quality Standards and Policy

- Surface Water Quality Standards
- Surface Water Quality Classification
- Contaminated Sediment Project Investigation
- Water Quality Effluent Limits
- Total Maximum Daily Loads (TMDLs)
- Impaired/303(d) Waterbodies

Program Title: Wastewater Program**Authority and Funding Sources:**

The Department gets its authority to protect groundwater quality, surface water quality, and public health under the Federal Clean Water Act and Chapters 281, 283, and 160 of Wisconsin Statutes. Under the authority granted by these laws, Wisconsin Administrative Codes pertaining to point and non-point source pollution control were written. These codes specify the classification of surface waters, effluent limitations and standards required for discharge to a water of the state, wastewater permitting procedures, construction requirements for wastewater treatment facilities, pretreatment standards for industries discharging to municipal treatment works, and requirements for animal waste and stormwater management.

Funds to run this program come through federal government Clean Water Act funding and state general program revenues.

*Core Work:**WPDES Permits:*

- A. Issuance of wastewater discharge permits to facilities (municipal and industrial) which discharge directly to surface or groundwater.
 1. Specific Permits: Permits are reissued individually every 5 years, unless modified earlier. Issuance of permits
 - a) Calculations of effluent limitsGeneral Permits: Permits are issued categorically
- B. Compliance Follow-up Activities:
 1. Area engineers and specialists review required reports, perform compliance surveys and sampling, and assist treatment plant operators to comply with wastewater standards as specified in administrative codes, statutes, and in WPDES permits.
 - a) Discharge Monitoring Reports
 - b) Groundwater Turnaround Documents
 - c) Compliance Maintenance Reports
 - d) Sludge reports
 - e) Compliance Schedule Reports

Pretreatment Program

- A. Industrial
 - 1. Identification of industries to which categorical standards apply.
 - 2. Review of Baseline Reports
 - 3. Review of Periodic Compliance Reports
- B. Municipal- Cities with a design flow of > 5 MGD (or others which may have significant problems) are required to develop their own pretreatment program. There is one facility in the NOR region: City of Superior.
 - 1. Review Annual and Periodic Reports.
 - 2. Perform audits and compliance surveys

Septage

- A. Ensure compliance with NR 113
- B. Review landspreading site requests
- C. Respond to complaints and attend meetings regarding controversial projects.
- D. Review annual landspreading reports
- E. Assist haulers with certification and licensing requirements

Sludge

- A. Review annual reports
- B. Assist operators with questions regarding regulations
- C. Review landspreading site requests
- D. Follow-up on violations

Stormwater

- A. Provide information regarding regulations
- B. Issue permits
- C. Review permit-required reports
- D. Follow-up on violations

Economic Assistance

- A. Assist communities before and during construction by acting as a liaison with Environmental Loans program staff.
- B. Attend meetings to discuss the program with communities.
- C. Evaluate conformance with loan/grant specifications during construction.
- D. Complete annual economic needs survey.

Plan Review

- A. Review facility plans for new or additional construction projects.
- B. Review municipal, industrial, and pretreatment engineering plans and specifications for completeness and compliance with design codes.

Program Title: Nonpoint Source Pollution Abatement Program**Authority and Funding Sources:**

The WDNR Nonpoint Source Pollution Abatement (Priority Watershed Program) Program gets its authority for protecting the surface waters and groundwater from nonpoint source pollution

from Section 281.65 of the Wisconsin State Statutes. This program is administered under Chapter NR 120, Wisconsin Administrative Code.

The nonpoint pollution program is currently undergoing restructuring. The priority watershed program is being gradually replaced by short-term grants that will address specific projects rather than focusing on entire watersheds.

Funding for the program comes from a variety of sources. Under the old priority watershed program, counties and municipalities received money in two forms: local assistance grants or LAG money from DNR that paid for staff and office expenses, and Nonpoint Source Grants from the DNR, which are given to the local units of government for the installation of best management practices (BMP's). Money for the reimbursement of Cost Share Agreements (ACRA, or Anticipated Cost Share Reimbursement Amount) and money for Targeted Runoff Management (TRiM Grants) comes from bonds. As of the year 2000, the Department of Agriculture, Trade, and Consumer Protection (DATCP) is responsible for getting the LAG money to the counties. The DNR receives money in S319 of the Clean Water Act grants from the federal EPA in order to staff the nonpoint program.

Core Work:

The NPS program is currently being redesigned. Chapter NR 120 is being rewritten and expanded, and therefore, the methods of controlling nonpoint pollution are changing. The goal of these priority watershed programs is to improve and protect the water quality of surface waters and groundwater within the watershed. Priority watershed programs are voluntary. They encourage landowners to control nonpoint pollution on their properties through cost sharing of BMP's. These plans have both rural and urban components.

Water quality is both protected and improved by controlling polluted runoff from both agricultural and non-agricultural practices. For the rural component, BMP's can include concrete barnyards, manure storage systems, animal lot abandonment, well abandonment, nutrient and pest management, grassed waterways, critical area stabilization, and clean water diversions. Non agricultural BMP's include road and construction site erosion control, wetland restoration, and lakeshore buffer restoration. Urban practices include street sweeping and stormwater detention basins.

As priority watershed programs end, they will be replaced by Targeted Runoff Management projects (TRiM). These are projects that are more specific in nature and may last up to three years. They are scored on a competitive basis, based on the amount of pollutant control they will achieve and the degree of impairment of the location.

One nonpoint source coordinator is located in Rhinelander. This coordinator administers and oversees the priority watershed program and will also assist with the TRiM grants. They also provide nonpoint source pollution advice to counties that are implementing their land and water plans. See Appendix 5 for a ranking of watersheds in the Headwaters Basin based on non-point source impairment or threats of future NPS impairment.

BUREAU OF DRINKING AND GROUNDWATER

Program Title: Drinking Water and Groundwater Program

Authority and Funding Sources:

The department gets its authority to protect groundwater quality and public health from the federal Safe Drinking Water Act and Chapters 280, 281, and 160 of the Wisconsin Statutes. Under the authority granted by these laws, Wisconsin Administrative Codes NR 809, 811, 812, and 140 were written. These codes specify minimum public and private water system construction requirements, drinking water quality standards, and drinking water quality monitoring requirements. NR 140 establishes groundwater quality standards used in regulating activities that do or may affect groundwater quality. Funds to run our program come from the federal government, through Safe Drinking Water Act funding, and the state, through general program revenue dollars.

Core Work:

The Drinking Water program has responsibility to assure the provision of safe, high quality drinking water and the protection of the groundwater. This is achieved by enforcing minimum well construction and pump installation requirements, conducting surveys and inspections of water systems, investigation and sampling of drinking water quality problems, and requiring drinking water quality monitoring and reporting. A team of specialists, engineers, hydrogeologists, and a program expert and program assistants staff the program.

Drinking water staff geographic work assignments range from two or three counties for each specialist, to multiple counties (half of the region) for engineers and program assistants, to the entire 18-county region for the expert and hydrogeologist.

Groundwater quality and public health are protected by:

Sampling: Passage of the Safe Drinking Water Act 25 years ago opened a new era in testing public water supplies to ensure that glasses of water that you draw from the tap is safe. Operators of public water supply systems are required to monitor their water to make sure it does not exceed the Maximum Contamination Level (MCL) for 80 different microbial and chemical contaminants. When a public water system exceeds a drinking water standard, it must notify the public of the violation, identify the source of the problem, take corrective action if necessary and do follow up sampling.

The amount and frequency of required sampling is determined by the type of contaminant and the size (population) of the public system. Public water systems range from large municipalities to small, rural resorts, restaurants, schools, and churches.

Proper Well Construction: Water systems, whether public or private, must be located and constructed to certain minimum standards. These standards, which employ widely accepted sanitary engineering principles and techniques, provide water systems and groundwater sources protection from contamination.

Inspections: drinking water staff inspects Public water systems every 5 years. Staff conduct well construction site field surveillance of well drillers and pump installers to ensure private well construction requirements are utilized. Staff also investigate drinking water quality or well complaints, and do inspections of newly constructed wells.

Protecting the Source: Protecting groundwater means preventing what goes on the ground from going into groundwater. For example, by looking at soil and rock types, thickness of soil and rock layers, and depth to the groundwater, Department staff can make decisions about where waste can be spread or where a landfill can be safely constructed. Identifying and documenting the presence (or absence) of potential contaminant sources in the vicinity around wells is also a mechanism for proactive protection of a water supply.

Technical Assistance to Well Owners and the Public: Staff provide assistance to public and private well owners to help solve water quality complaints and water system problems. They also provide interested citizens with informational or educational materials about drinking water supplies and groundwater.

LANDS DIVISION

BUREAU OF WILDLIFE MANAGEMENT

Program Title: Wildlife Management

Authority and Funding Sources:

Authority is found in Chapters 23 and 29 of Wisconsin Statutes, and Chapters NR1-100 of the Wisconsin Administrative Code. Funding comes from the federal government in the form of Endangered Species grants and Pittman-Robertson grants and from state government in the form of hunting and trapping license revenues, voluntary income tax contributions, general program revenue and Stewardship funds.

Description of Core Work:

The Bureau of Wildlife Management oversees a complex web of programs that incorporate state, federal and local initiatives primarily directed toward wildlife habitat

management and enhancement. Programs include land acquisition, development and maintenance of State Wildlife Areas, and other wild land programs such as State Natural Areas.

Want to know more about wildlife programs?

<http://www.dnr.state.wi.us/org/land/wildlife/>

<http://www.dnr.state.wi.us/org/land/wildlife/links.html>

Wildlife Staff work closely with staff of state and county forests to maintain, enhance, and restore wildlife habitat. Wildlife Management staff conduct wildlife population and habitat surveys, prepare property needs analysis's, develop basin wildlife management plans and collaborate with other DNR planning efforts such as Park, Forestry or Fishery Area Property Master Plans to assure sound habitat management.

Wildlife biologists prepare annual game harvest recommendations for deer, bear, and turkey and Canada geese. Biologists in the Headwaters Basin work closely with Endangered Resources staff to monitor and manage the growing gray wolf, bald eagle, osprey, fisher, and American marten populations. They evaluate and update hunting, trapping and property management regulations, administer permits for state licensed game farms, shooting preserves, fur farms, and dog training and wildlife rehabilitation facilities. Wildlife Management oversees many educational programs to encourage responsible land management techniques and practices.

BUREAU OF PARKS AND RECREATION**Program Title: Parks and Recreation****Authority and Funding Sources:**

The Department gets its authority for administering the Parks and Recreation Program from Chapter 27 Wisconsin Statutes. Funding sources include: the general fund, the conservation fund, and the recycling fund, program revenue funds and federal grants.

BUREAU OF ENDANGERED RESOURCES**Program Title: Endangered Resources****Authority and Funding Sources:**

It is unlawful to take, or destroy, state listed animals on any lands without a take permit. For listed plants, the law prohibits taking where it occurs on public lands (except in the course of forestry, agriculture or utility actions). Chapter 29.604 of the Wisconsin Statutes authorizes protection of endangered and threatened species. Federal law requires protection of federally listed, proposed and candidate endangered and threatened species, and proposed and listed critical habitat. Special concern species should also be protected.

Funding for the Endangered Species Program comes from a number of sources including tax checkoff revenue, license plates, general program revenues (GPR), gaming revenue, Natural Heritage Inventory chargebacks, wild rice permits, general gifts and Pittman Robertson grants.

Core Work:

Endangered Resources staff provide the Headwaters Basin with expertise and advice on endangered resources. They manage the Natural Heritage Inventory Program (NHI), which is used to determine the existence and location of native plant and animal communities and of Endangered or Threatened Species of Special Concern. The NHI helps identify and prioritize areas suitable for State Natural Area (SNA) designation, provides information needed for feasibility studies and master plans, and maintains the list of endangered and threatened species. All management activities conducted by Wildlife Management and Forestry staff must be reviewed to determine the impact on NHI-designated species.

Want to know more about endangered resources?
<http://www.dnr.state.wi.us/org/land/er/>

A permit for the incidental take of an Endangered or Threatened species is required under the State Endangered Species Law. The Endangered Resources Program oversees the permit process, reviews applications and makes permit decisions.

FORESTRY DIVISION

BUREAU OF FORESTRY

Program Title: Forest Management

Authority and Funding Sources:

WI. Stats. Chapter 26 Protection of Forest Lands and Forest Productivity, WI. Stats. Chapter 28 Public Forests.

Funding for the forestry program is supported primarily by a fixed rate mill tax on all property in the State of Wisconsin. (Stat. 70.58). Other support is received from the federal government, from recreation fees, from sale of forest products, from sale of state produced nursery stock, forest tax law payments, and other miscellaneous sources.

Core Work:

All activities of the Forestry Program help support efforts to *promote and ensure the protection and sustainable management of Wisconsin's forests*. The Department has a long tradition of providing forestry, fire control, outdoor recreation, and habitat protection technical services to a wide variety of clients in this basin. As in the past, this effort requires close coordination of services and support between the Bureau of Forestry, Northern Regional staff, and Headwaters Basin Land & Forestry Teams. The following elements represent the core work areas within the Forestry Program within the Headwaters Basin:

County Forest Program

This is a long-standing county/state partnership involving 29 counties with more than 2.3 million acres enrolled into Wisconsin's County Forest Program. This program is authorized under Chapter 28 Wis. Stats, NR 47.40 and NR 48. Under this 70-year partnership, the Department has committed to provide a minimum level of technical assistance to each county forest. This assistance is coordinated through the DNR liaison forester assigned to each county forest and results in a variety of DNR staff with work assignments to assist with management on these county forests. The counties in turn agree to apply sustainable forest management practices, cooperate on habitat management projects, and allow their lands to be open for public hunting and recreation.

Services include assistance with development of each County Forest Ten Year Comprehensive Plan, assistance with timber sale design, sale establishment, sale administration, reforestation, development of wildlife habitat, protection of endangered and threatened species, interest free loans for operation and acquisition, and cost-sharing of county forest staff. Basin and regional staff approve county forest work plans, review ten-year forest plans, and review and approve timber sales. Other services provided include insect and disease technical assistance, wild fire protection, technical training, recreational facility grants, and shared communications.

State Forests

The Northern Highland and American Legion Forests lie in the Headwaters Basin. The Northern Highland and American Legion Forests contain a total of 223,237 acres. These forests were created in the early 1900s to provide a range of benefits such as recreation, forest products, biodiversity, and water quality. Today, this property offers diverse recreational opportunities, wildlife habitat, watershed protection, and the sustainable harvest of forest products. Currently,

development of a new Master Plan for the Northern Highland-American Legion State Forest is underway.

Management on the State Forests is guided by Wis. Stats 28.04(2) and existing Master Plans to:

- assure the practice of sustainable forestry and use it to assure that state forests can provide a full range of benefits for present and future generations.
- assure that management is consistent with the ecological capability of the property and with long-term maintenance of sustainable forest communities.
- Benefits include soil protection, public hunting, protection of water quality, production of recurring forest products, outdoor recreation, native biological diversity, aquatic and terrestrial wildlife, and aesthetics and each forest shall reflect its unique character and position in the regional landscape.

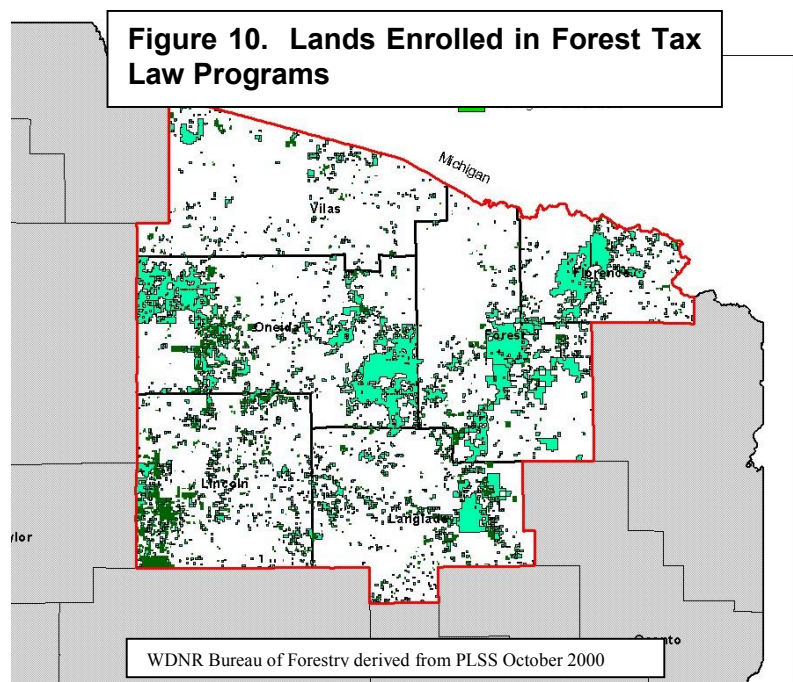
Other State Lands

The Department owns and manages a variety of wildlife, fisheries, natural areas, and other lands within the Basin. Forest management activities such as maintenance of property vegetation inventory records, timber harvest establishment, reforestation, and other practices are generally assigned to a basin forester or forestry technician to implement. During planning of the activity, the work is reviewed by the local wildlife biologist, fishery biologist, or property manager.

Private Forestry

The Department's goal is to motivate private forest landowners to practice sustainable forestry by providing technical forestry assistance, state and federal cost-sharing on management practices, sale of state produced nursery stock for reforestation, enrollment in Wisconsin's Forest Tax Law Programs, advice for the protection of endangered and threatened species, and assistance with forest disease and insect problems. Each county has at least one Department forester assigned to respond to requests for private forestland assistance. These foresters also provide educational programs for landowners, schools, and the general public.

Both private and industrial forest landowners have enrolled their lands under the Managed Forest Law (Wis. Stats. Ch 77.80), which offers an incentive program to practice sustainable forestry and a reduction in the annual real estate taxes during the 25 or 50 year contract period. In previous years, lands could be enrolled under the Forest Crop Law program but only the Managed Forest Law (MFL) program is available today (Figure 10.) The MFL program continues to attract and protect more lands as landowners dedicate their lands to sound forest management and as assessed values increase on undeveloped forestlands. The growing success of this program expands the Department's commitment to not only examine new applications for entry but also monitor completion of mandatory



harvest and other forestry practices on enrolled lands.

Urban Forestry

Technical assistance for managing Wisconsin's urban forests is provided local and tribal governments, nonprofit organizations, and other public agencies through regional urban forestry coordinators. This staff helps communities plan urban tree selection and removal, address insect and disease issues, offer financial assistance, and education for citizens.